



# Blendtec Total Blender Teardown

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## INTRODUCTION

We wanted to show off all the hard work the good folks at [Blendtec](#) have put into their machines, so we took apart their famous "Will it Blend?" blender!

We also made a [video slideshow](#) of the teardown!



### TOOLS:

- [11mm Wrench](#) (1)
  - [3/8" Allen Wrench](#) (1)
  - [Flathead Screwdriver](#) (1)
  - [Phillips #2 Screwdriver](#) (1)
  - [Large Needle Nose Pliers](#) (1)
  - [Tweezers](#) (1)
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## Step 1 — Blendtec Total Blender Teardown



- Our friends at [Blendtec](#) were awesome enough to lend us a blender for this teardown!
- \$400 gets you:
  - Their awesome "base" 1560W Total Blender (as if you can call anything with 1560 Watts "base")
  - Instruction manual
  - CD-ROM with product tour and video recipes
  - Lifestyles Recipe Book, good for many blenderiffic creations

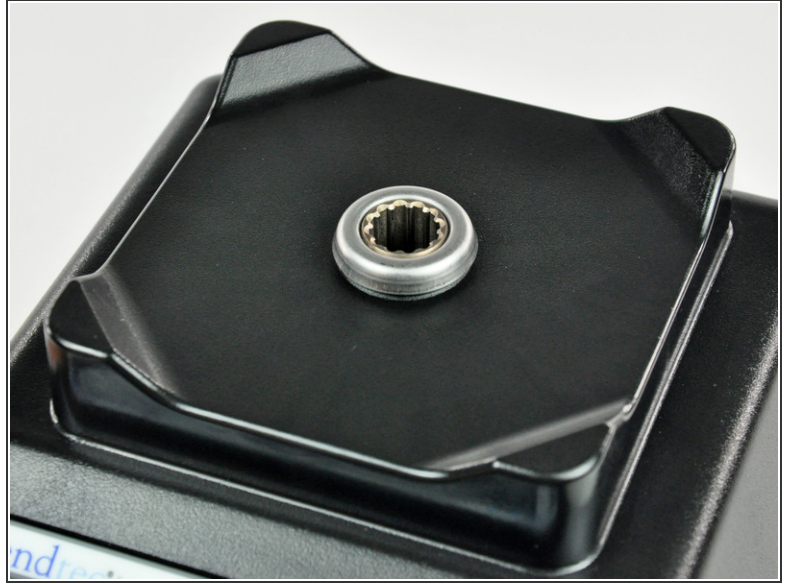
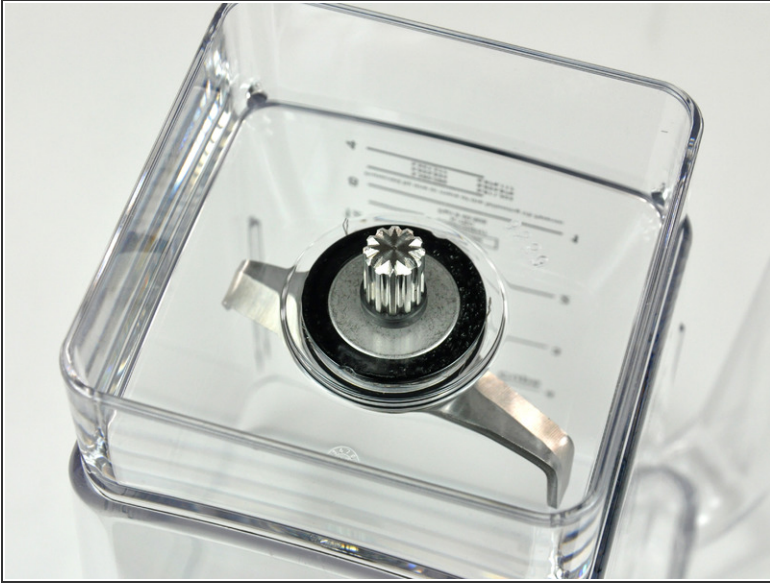
## Step 2



- Fully digital controls, along with an LCD display. None of that "push-button" stuff found on \$30 blenders.
- But will it blend?
  - We were so anxious to open up this puppy, we never found out. We'll take the word of thousands of satisfied customers, as well as [Blendtec's hilarious videos](#).
- A mechanical switch on the back of the unit stops any bad ideas from turning into deadly ideas.



## Step 3



- You'll notice the absence of plastic. Other blenders use plastic shafts as a safety mechanism. If the blade gets stuck, the blade/motor connection will sever, as the plastic will either break or melt.
- The Total Blender has several electronic monitors that enable it to have a full metal shaft. That's how it transfers all that power to your ice cubes.
- The splined connection between the motor shaft and the blades is perfectly suited to transfer the astronomical torque of the motor to the edge of the rotor blades.

## Step 4



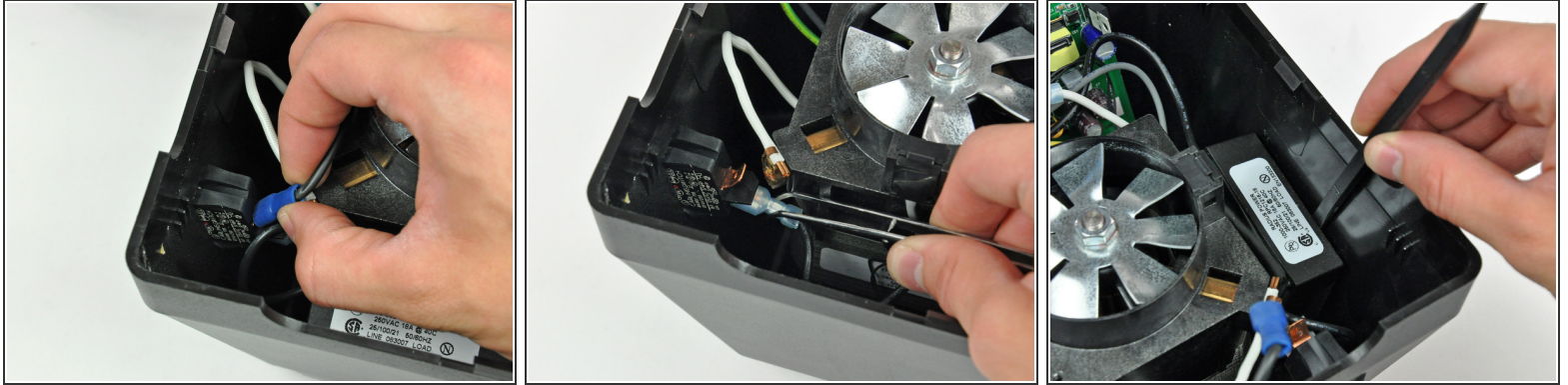
- The bottom of the blender. Best place to go if you need your serial number.
- Remove the two Phillips screws (deeply) recessed into the bottom housing.
- Four side tabs hold the plastic bottom housing in place. Opening the blender is as easy as one, two, three, four.
- The bottom housing is very ventilated -- essential for cooling the 1560W motor housed within.

## Step 5



- There's another thin plastic cover underneath the main cover. Nothing too exciting yet.
- The cover most likely directs air toward the vents in the bottom housing.
- Notice all the free space. This is the type of device mostly unaffected by the trend to shrink all components as much as possible.

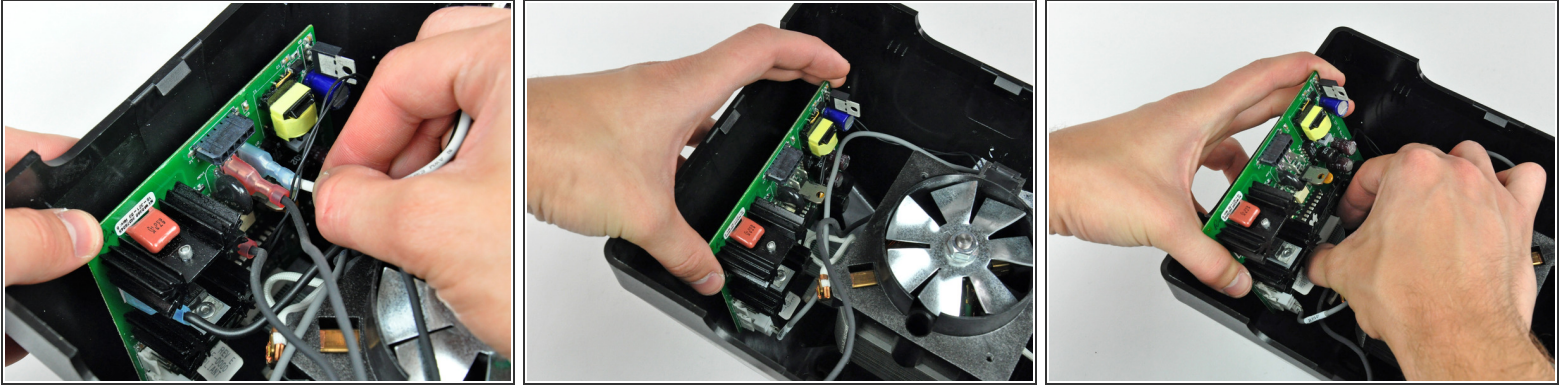
## Step 6



- Now onto the fun stuff.
- Connectors abound!
  - We begin by pulling out the power switch -- can't be too careful nowadays, especially with the recession and all...
  - Another spade connector lies underneath. We pulled that one out too.
  - Insert a spudger between the EMI power line filter and the case to separate the double sided tape. The unit comes right off after a couple of spudger twists.

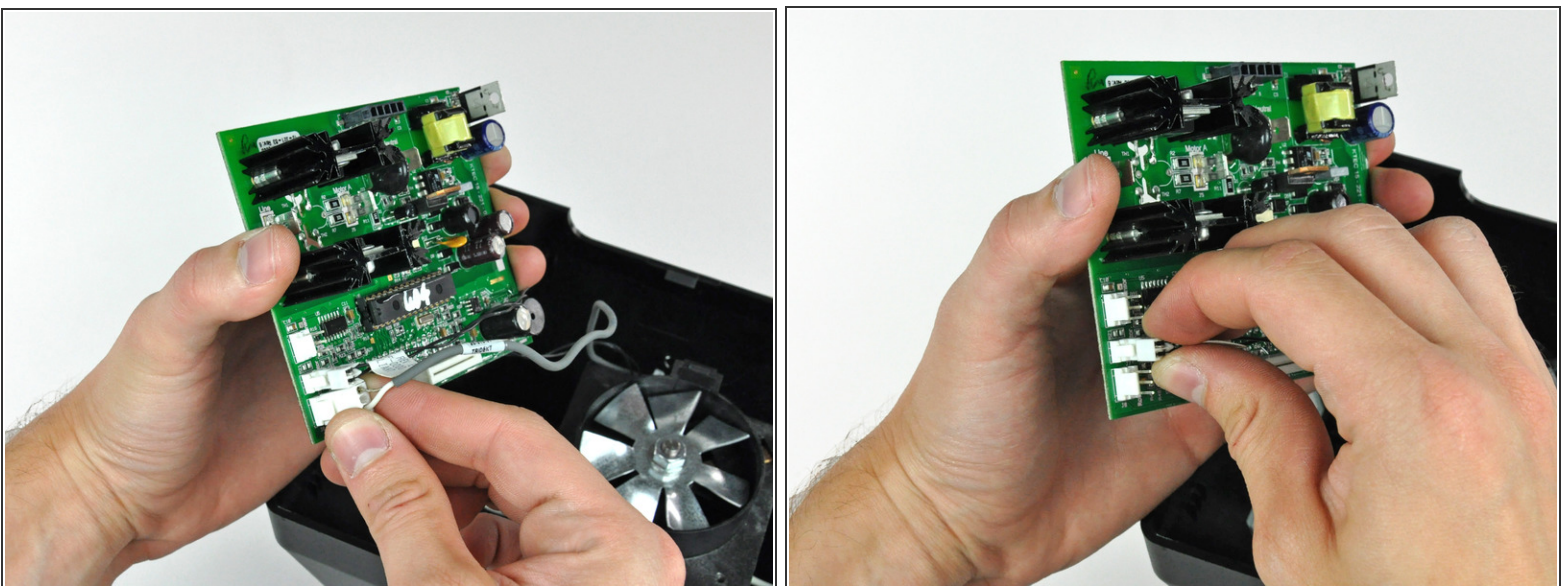


## Step 7



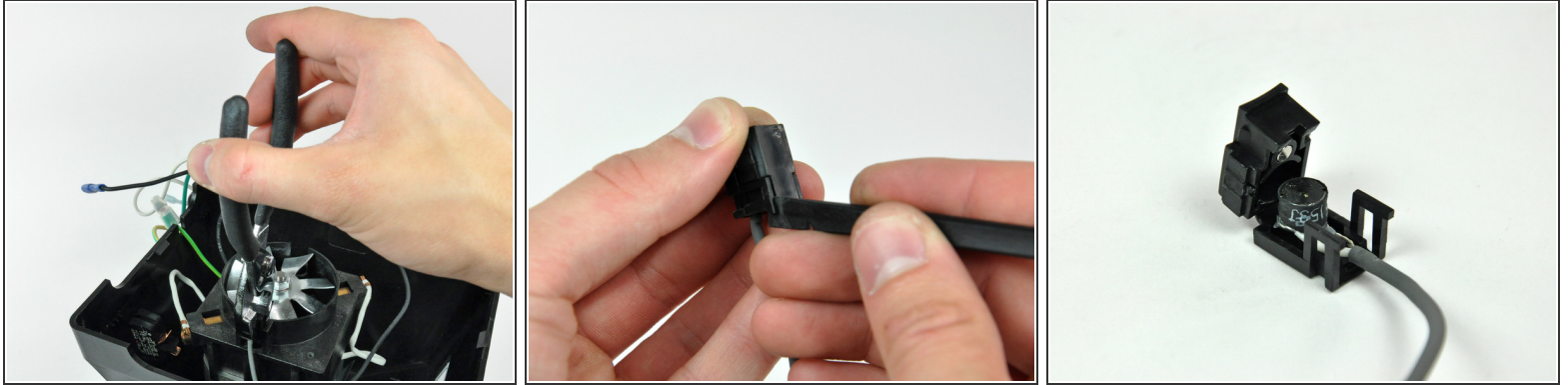
- Onto the logic board, which may be the most important of all the internal goodies. It regulates all the aspects of operation and safety for the device.
- The logic board simply sits on brackets molded into the plastic housing. No screws!
  - Disconnect a couple of spade connectors from it, and slide it out a bit to reach the control panel ribbon cable connector.
  - Disconnect the control panel ribbon cable from the board. This should almost free the logic board from the rest of the blender.

## Step 8



- Two more connectors, and the logic board is free to roam about the country!

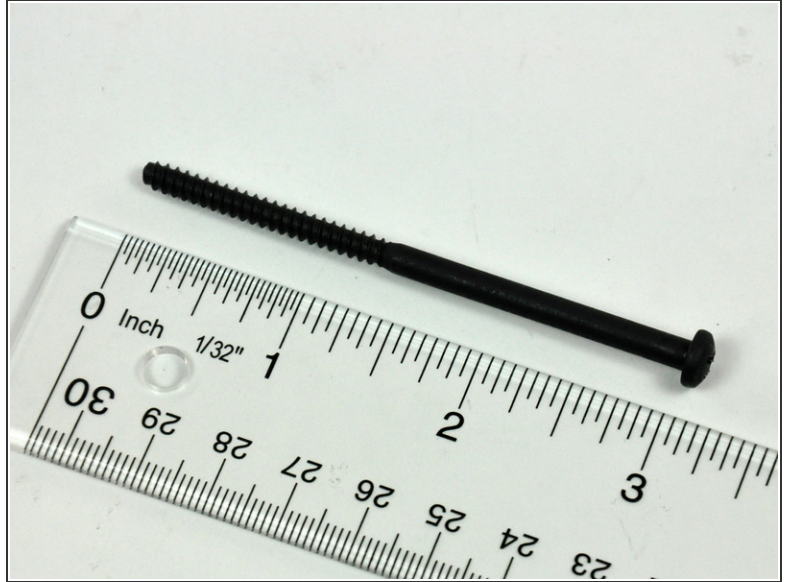
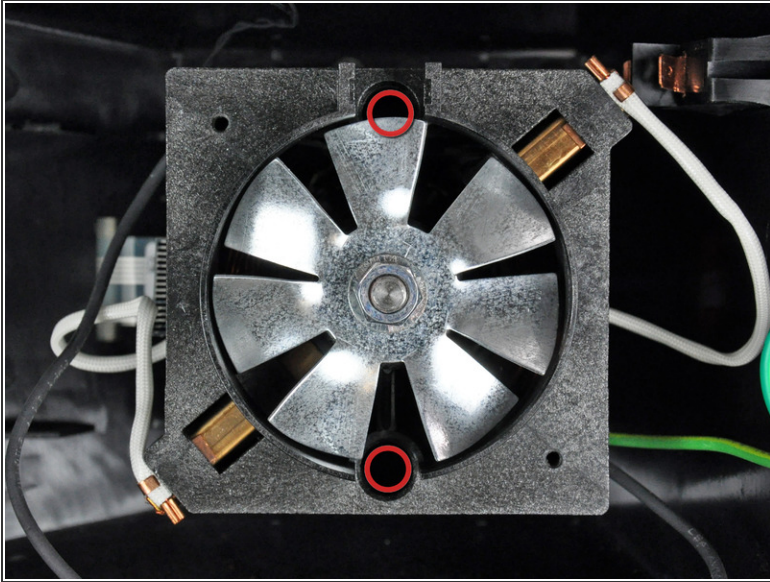
## Step 9



- Removing the speed sensor.
  - Aptly named, the speed sensor monitors the speed of the spinning shaft. Should things get out of hand, the sensor will shut off the motor.
- The speed sensor uses inductive pickup to tell the control circuitry how fast the shaft is spinning. Inductive pickup is triggered by ferrous metal passing by in close proximity, causing a current to be induced in the pickup. This is really the same effect used by an electric guitar to pick up the string vibrations.
- Blendtec informed us that the Total Blender includes what they call a "hammer-fire" system. The main microprocessor will trigger this system if it detects that the blade stopped spinning. The processor will send a series of strong electric pulses with the intent to free the blades from the obstruction. If that fails, it will shut off the motor to prevent any damage.

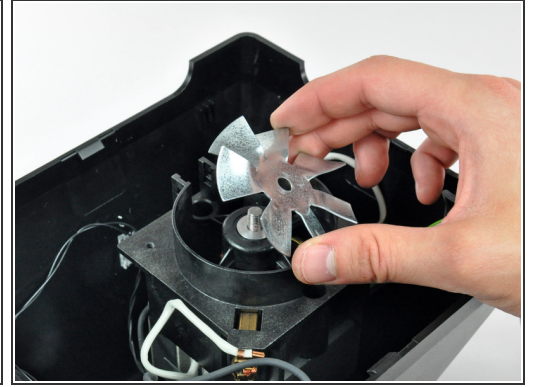


## Step 10



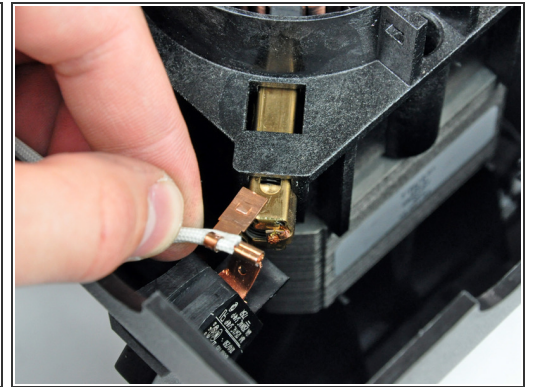
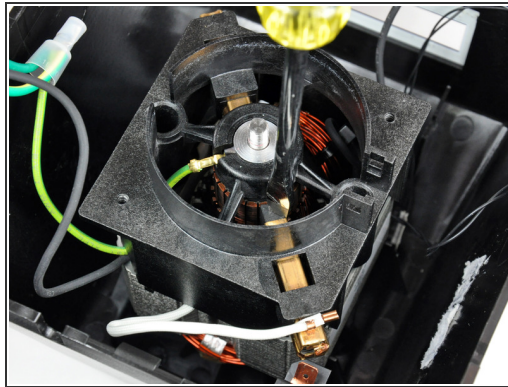
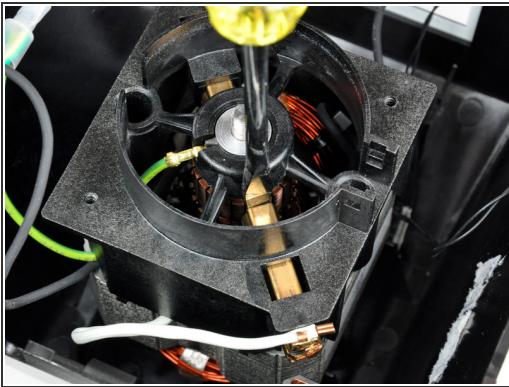
- Remove two Phillips screws (of the four holding together the entire device) from the brush/slip ring housing.
- These puppies didn't come out without a fight.
- No wonder why -- they're over 3" long! Containing the inertia of the rotor spinning at 28,000 rpm is *kind of* important.

## Step 11



- Remove the single nut from the fan end of the shaft.
- A 3/8" Allen wrench conveniently fits into the splines at the other end of the shaft, making the nut removal a snap.
- After removing the nut, the fan simply lifts off the shaft.

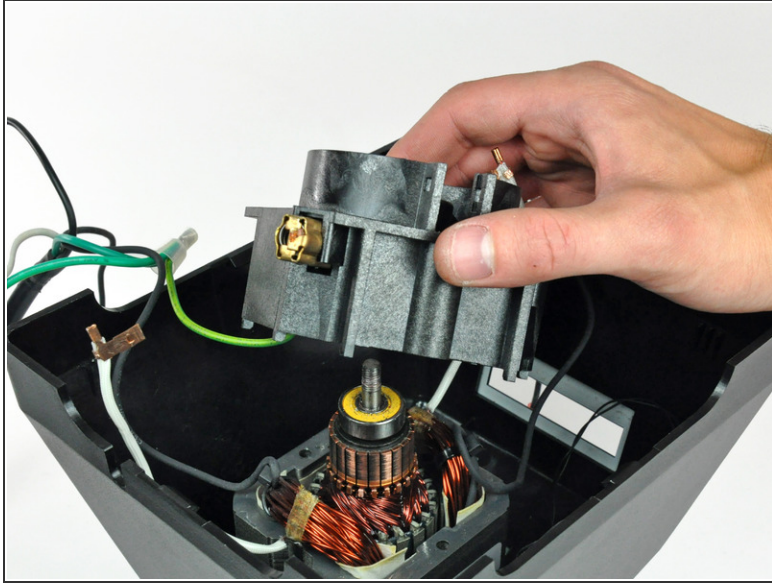
## Step 12



- Use a flat blade screwdriver to 'walk' each of the two brass brush housings away from the motor shaft.
- After the brass brush housings are separated from their housing, the brush spade connectors simply slide out.



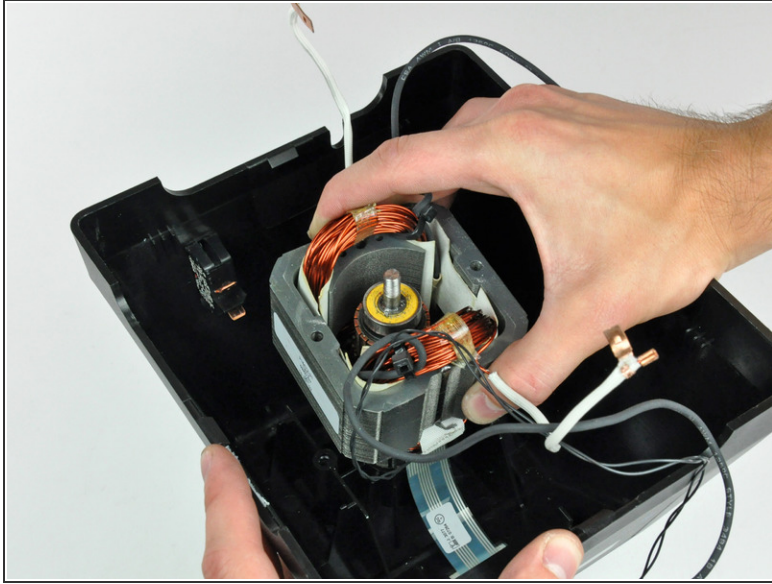
## Step 13



- Removing the brush/slip ring housing exposes the support ball bearings at the tail of the motor shaft.
- The brass brush housing is connected to the pure carbon brush with a braided copper wire.
- The carbon brushes normally wear out before the rest of the motor.

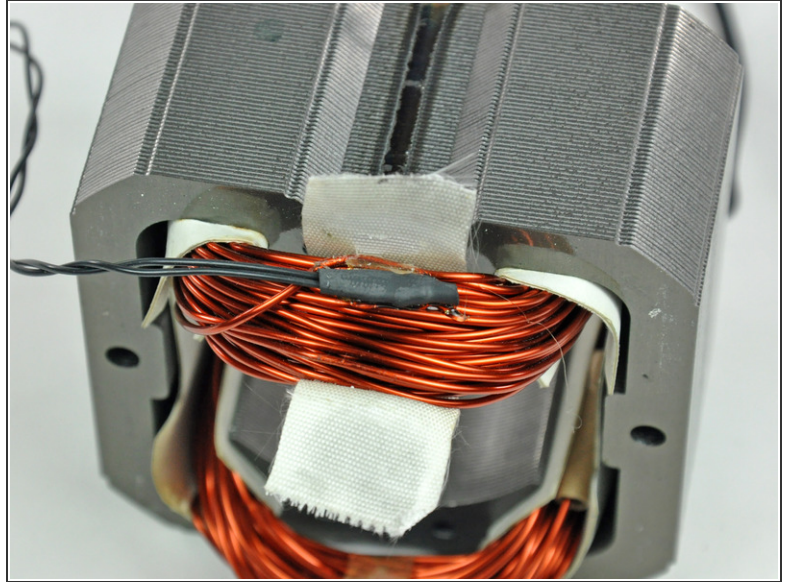
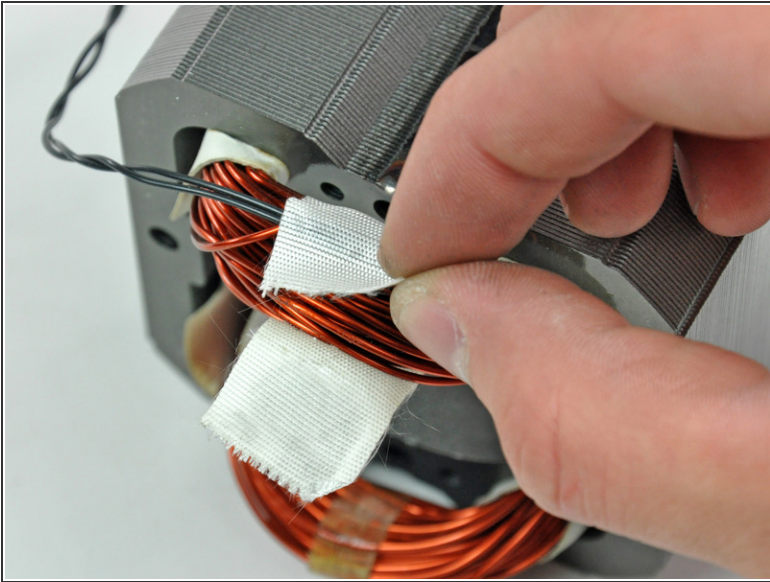


## Step 14



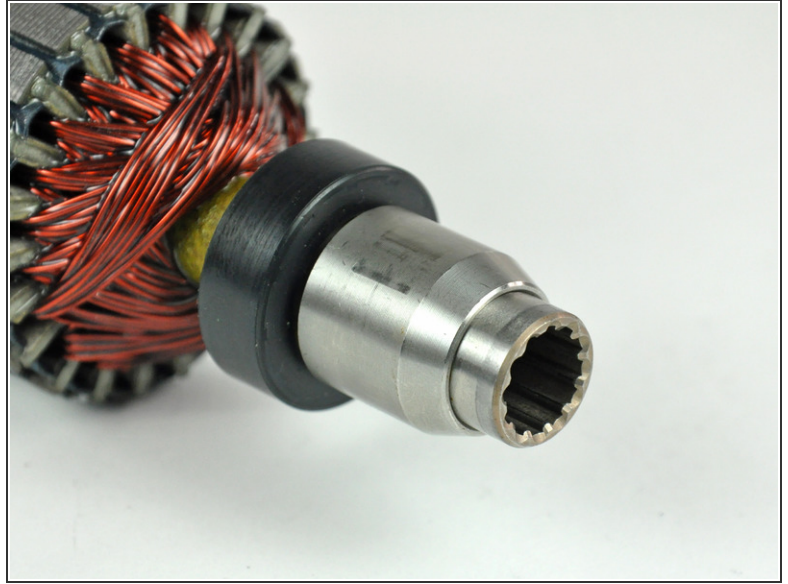
- Lifting the stator out of the Blendtec.
- The weld connecting the stack of metal plates creating the frame of the stator is just plain *beautiful*.

## Step 15



- Tracing the small black wire to the bottom of the stator and peeling back the tape reveals...
- A thermistor!
- The thermistor is used to monitor the temperature of the windings to avoid meltdown.
  - We're told that the motor temperature has to reach a maximum of 130 degrees Celsius (266 degrees Fahrenheit) before being shut off!

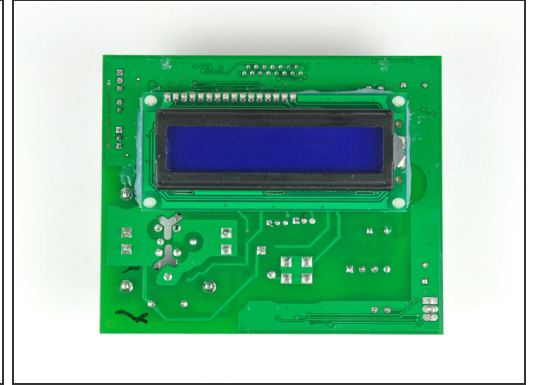
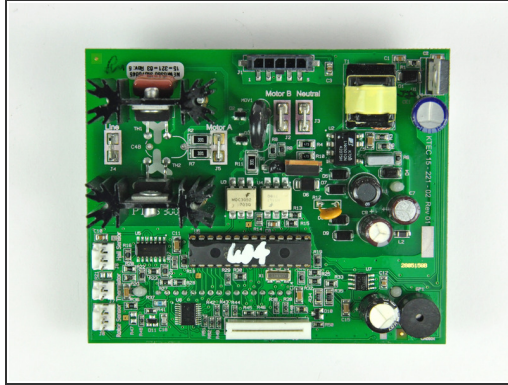
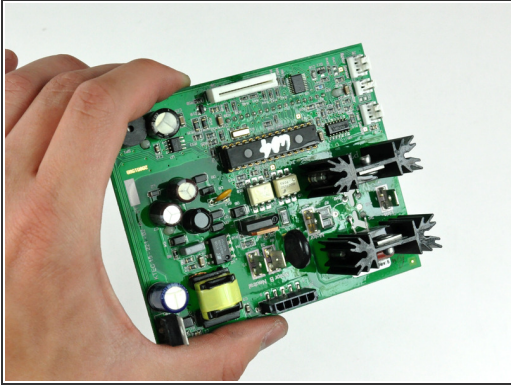
## Step 16



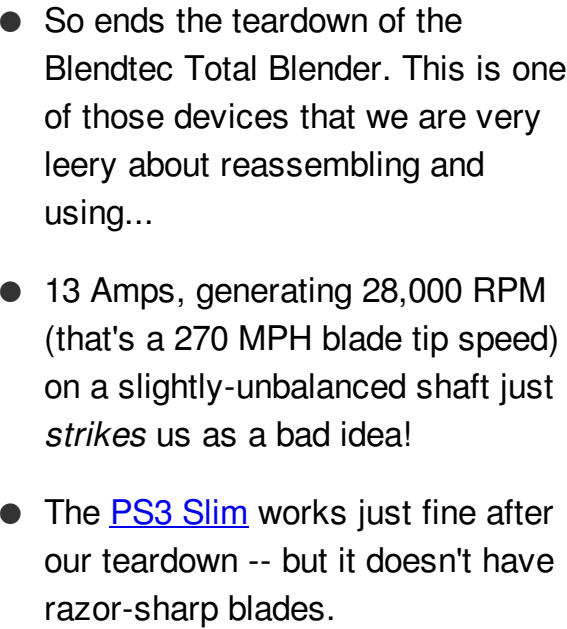
- Just look at this rotor. If looks could kill, you just might get shot.
- This a pod racer engine is, hmm? Yeesssssss.
- The two bearings are reported to be 608RS, which is a commonly available size. The upper bearing has a rubber sleeve over it in the photo.



## Step 17



- The logic board.
- First picture shows the shininess of the logic board. The board is clear-coated to prevent condensation from attacking the electronics.
- The [hi-res version](#) of the board shows all the intricate details -- inductive pickup/rotor sensor plugs, the thermistor plug, etc.
- The LCD panel is located on the back of the board, thus eliminating the need for any extra circuit boards.



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